CLAIMS

What is claimed is:

1. An automated process for forming lightweight concrete building units, comprising the steps of:

A) providing a plurality of molds;

B) measuring each of a first plurality of ingredients;

C) mixing said first plurality of ingredients into a first batch of a cementitious slurry;

D) pouring said first batch into a first mold;

E) measuring each of a second plurality of ingredients sufficient to form a second batch while said first batch is mixing;

F) transporting said first batch while said first batch is mixing;

G) pouring said first batch into a first mold; and

H) mixing additional batches, transporting and pouring said additional batches into additional molds until said first batch has cured to at least a point where said at least one first building unit is rigid enough to be handled.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

2. The process of claim 1, further including the steps of (I) removing said at least one first building unit from said first mold and (J) repeating steps B through H.

3. The process of claim 2, further including the step of (K) applying a release agent to each of said plurality of molds prior to receiving a batch of cementitious slurry.

4. The process of claim 1, wherein the number of said plurality of molds is approximately equal to the time it takes to perform steps D through H divided by the time it takes to perform steps C through D.

5. The process of claim 1, wherein steps (B) and (E) further include the steps of (L) weighing a first ingredient to approximately a first weight, (M) adding a second ingredient to said first ingredient to approximately a second weight, (N) adding a metered amount of a foam and a metered amount of water.

6. The process of claim 5, wherein step (N) includes adding said metered amount of water to a mixer before said

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

first and second ingredients are added to said mixer and wherein said mixer is activated to rinse the inside of said mixer between batches.

7. The process of claim 5, further including the step of (O) adding a third ingredient to said first and second ingredients to approximately a third weight.

8. The process of claim 5, further including the step of (P) heating said water to a temperature that when combined with the other plurality of ingredients, the temperature of the mixture is below the critical temperature of said foam.

9. The process of claim 5, further including the step of (Q) providing a foaming agent heated to a temperature near the critical temperature of said foaming agent, (R) generating a heated foam from said foaming agent, and (S) adding said heated foam to said plurality of ingredients.

10. The process of claim 5, wherein step (L) includes the step of (T) metering said first ingredient at a first

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

rate to approximately 90 percent of said first weight and metering said first ingredient at a second slower rate to approximately 100 percent of said first weight and step (M) includes the step of (U) metering said second ingredient at a first rate to approximately 90 percent of said second weight and metering said second ingredient at a second slower rate to approximately 100 percent of said second weight.

11. The process of claim 7, wherein step (O) includes the step of (V) metering said third ingredient at a first rate to approximately 90 percent of said third weight and metering said third ingredient at a second slower rate to approximately 100 percent of said third weight.

12. The process of claim 1, further including the steps of (W) providing a transport container, (X) pouring said first batch into said transport container and (Y) transporting said first batch to said first mold prior to performing step (D).

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

13. The process of claim 12, further including the step of (Z) returning said transport container for receiving said second batch.

14. The process of claim 13, wherein said transport container comprises a mixer.

15. The process of claim 11, wherein step (Y) further includes the steps of (AA) transporting said first batch at a first speed to within a relatively short distance of said first mold and (BB) transporting said first batch at a second slower speed to a substantially precise position relative to said first mold.

16. The process of claim 13, further including the step of (CC) transporting additional batches to additional molds in substantially the same manner as step Y.

17. The process of claim 1, further including heating said plurality of molds to a temperature above the critical temperature of said foam.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

18. The process of claim 1, wherein said first ingredient comprises sand, said second ingredient comprises cement, and said third ingredient comprises a quick setting cement.

19. The process of claim 1, further including the step of (DD) adding fibrous material to each of said batches at least by the time said each of said batches is still in a slurry state.

20. The process of claim 2, further including the step of (EE) transporting said at least one building unit to a hydration station and applying water to said at least one building unit.

21. The process of claim 1, further including the step of (FF) compressing said cementitious slurry within said mold to form a lightweight concrete building unit have a substantially precise volume.

22. A process for forming lightweight concrete building units, comprising:

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

(A) adding measured amounts of a plurality of wet and dry ingredients;

(B) mixing said ingredients into a cementitious slurry;

(C) pouring said slurry into a mold;

(D) compressing said slurry within said mold in at least one direction to form at least one lightweight concrete building unit having a substantially precise volume when cured;

(E) allowing said slurry to cure into at least one building unit;

(F) removing said at least one building units from said mold.

23. The process of claim 22, wherein step (A) further includes the steps of (G) weighing a first ingredient to approximately a first weight, (H) adding a second ingredient to said first ingredient to approximately a second weight, (I) adding a third ingredient to said first and second ingredients to approximately a third weight, (J) adding a metered amount of a foam and (K) adding a metered amount of water.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

24. The process of claim 23, further including the step of (L) heating said water to a first temperature prior to mixing so that when said dry ingredients are mixed with said water, a resulting mixture is at a temperature below the critical temperature of said foam.

25. The process of claim 24, further including heating said plurality of molds to a second temperature above the critical temperature of said foam.

26. The process of claim 25, further including the step of (M) providing a foaming agent heated to a temperature near the critical temperature of said foaming agent and (N) generating a heated foam from said foaming agent.

27. The process of claim 25, wherein said pouring said slurry into said mold breaks down the foam in an outer layer of said slurry adjacent said mold forming a more dense outer layer.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

28. The process of claim 22, wherein step (G) includes the step of (O) metering said first ingredient at a first rate to an amount slightly less than said first weight and metering said first ingredient at a second slower rate to an amount substantially equal to said first weight, step (H) includes the step of (P) metering said second ingredient at a first rate to an amount slightly less than said second weight and metering said second ingredient at a second slower rate to an amount substantially equal to said second weight, and step (I) includes the step of (Q) metering said third ingredient at a first rate to an amount slightly less than said third weight and metering said third ingredient at a second slower rate to an amount substantially equal to said third weight.

29. The process of claim 28, wherein said first ingredient comprises sand, said second ingredient comprises cement, and said third ingredient comprises a quick setting cement.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

30. The process of claim 29, further including the step of (R) adding fibrous material to said cementitious slurry.

31. The process of claim 21, further including the step of (S) hydrating said at least one building unit.

32. A process for forming lightweight concrete building units, comprising the steps of:

(A) providing a mold;

(B) adding an aerated cementitious slurry to said mold;

(C) compressing said aerated cementitious slurry within said mold a substantially precise amount in at least one direction causing said aerated cementitious slurry to increase in density and creating a lightweight concrete building unit having a substantially precise volume.

33. The process of claim 32, further including the step of (D) heating said mold to a temperature above a critical temperature of said aerated slurry to collapse air cells along a surface of said mold.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

34. The process of claim 32, wherein step (C) includes causing air cells proximate the outer surface of said lightweight building unit to collapse resulting in said lightweight building unit having a denser outer layer along at least one surface thereof when cured.

35. The process of claim 32, further including the step of (E) compressing said aerated cementitious slurry in a second direction for imprinting a texture on at least one outer surface of said lightweight building unit.

36. The process of claim 32, wherein said cementitious slurry is comprised of sand, cement, a quick setting cement, fibers, foam and water.

37. The process of claim 36, further including the step of (F) providing a heated aerated cementitious slurry.

38. The process of claim 32, further including the step of (G) hydrating said lightweight concrete building unit.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

39. A process for forming a lightweight concrete building unit utilizing a mold that is capable of compressing the slurry to a substantially precise volume, comprising:

(A) providing a batch of an aerated cementitious slurry having a volume greater than the substantially precise volume;

(B) pouring the slurry into a mold;

(C) compressing the slurry within the mold until the substantially precise volume is reached; and

(D) allowing the slurry to cure within the mold;

whereby the cured lightweight concrete building unit has a denser outer layer and a substantially precise volume.

40. The process of claim 39, wherein the lightweight concrete building unit has external features for interlocking with other similar building units.

41. The process of claim 40, wherein the lightweight concrete building unit can be dry stacked with other similar building units.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

42. A process for forming lightweight concrete building units, comprising the steps of:

(A) selecting a foaming agent having a first critical temperature;

(B) generating a foam from said foaming agent;

(C) forming a cementitious slurry at a first temperature below said first critical temperature;

(D) adding said foam to said cementitious slurry;

(E) providing a heated mold having a surface temperature above said first critical temperature; and

(F) pouring said cementitious slurry into said heated mold.

43. The process of claim 42, further including (G) compressing said cementitious slurry within said mold to a substantially precise volume.

44. The process of claim 42, wherein said foaming agent has a second critical temperature above which said foam will collapse.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302

45. The process of claim 44, wherein said mold is heated to a second temperature above said second critical temperature.

46. The process of claim 42, wherein said first critical temperature is approximately 100 degrees Fahrenheit, said second critical temperature is approximately 150 degrees Fahrenheit, said first temperature is approximately 90 degrees Fahrenheit, and said second temperature is approximately 180 degrees Fahrenheit.

Morriss, Bateman, O'Bryant & Compagni
5882 South 900 East, Suite 300
Salt Lake City, Utah 84121
(801) 685-2302